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An Investigation on the Environmental Knowledge, Attitudes and Behavior of Maltese Youth

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Not much is known about the environmental knowledge, attitudes and actions of young people in the Maltese islands. The main actors that are responsible for the acquisition and development of environmental perspectives of young people in Malta are also not well known. There is as yet, little understanding of the extent to which these actors are fostering a sense of environmental responsibility and a greater commitment towards sustainable development. The methodology for this study includes an analysis of the local social, cultural and environmental milieu in which environmental knowledge, attitudes and actions form. Data collection occurred through a class administered questionnaire survey distributed to students in the post secondary age range. The results from the research indicated that students are more knowledgeable about the global environment than about the local environment, and that students receive most information from school, television and the Internet. The sources of environmental information perceived by young people are the most reliable including school, books and the Internet. The overall attitude of students towards the environment appears to be strongly positive; however, students seemed to perform few positive actions towards the environment.

Keywords: environmental attitudes, environmental behavior, environmental knowledge, youth, Malta

Introduction

The perception of environmental issues, as represented by the environmental actions, attitude and knowledge of young people is of great importance for a number of reasons:

(1) Knowing what students think about environmental issues will help to establish better pro-environmental education among them (Pawlowski, 1996);

(2) The involvement of youth in environment and development decision-making and in the implementation of programmes is critical to the long-term success of Agenda 21 (United Nations Conference on Environment and Development, 1992, p. 25);

(3) College students are an important segment of society and warrant attention in terms of studying environmental attitudes, as they have been the leading crusaders in the modern environmental movement. For example, the huge success of Earth Day 1970 in the USA was largely attributed to college students when approximately 1,500 colleges participated in the campaign (Harper, as cited in Thapa, 2001).

The Maltese National Youth Policy (Malta Ministry of Education, 2004), stated that the state should follow a policy that helps young people to take an active role in the protection and improvement of the environment for a sustainable future and encourage young people to adopt a pro-environmental attitude.

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Background to the Study—the Maltese Context

The Environment

The Maltese islands are a small archipelago, situated in the centre of the Mediterranean some 96 km south of Sicily and 290 km north of the coast of Libya. The Maltese archipelago comprises three inhabited islands: Malta, Gozo and Comino, together with a number of uninhabited smaller islands. The most serious environmental problems arise from the fact that Malta is one of the smallest states in the world with an area of 316 km^2, and one of the most densely populated. The population density stands at more than 1,200 persons/km^2. The high population density is augmented further by high tourist arrivals of about 1.2 million yearly (Mallia, Briguglio, Ellul, & Formosa, 2002). The main environmental issues on the island include: waste production and management, reliance on fossil fuels for energy production, high private motor usage and freshwater production requiring a high energy input.

The Educational System

Malta's state school sector is influenced to a large extent by the British educational system owing to its colonial past. The educational system is divided into three main sections:

(1) Primary education (from age five to 11);

(2) Secondary education (from age 11 to 16);

(3) Tertiary education (over age 16).

Schooling is compulsory from age five to 16 and kindergarten classes are provided from the age of three. In the primary and secondary sectors, there are state, church and private schools. About 30% of all students attend the non-state sector schools (Sultana, 1995). Church schools are substantially subsidised by the government and tuition is free. The state primary school system is localized in every village while the secondary school system is streamed into junior lyceums (for the academically gifted) and area secondary schools.

Malta used to rely on English based GCEs (General Certificates of Education) ordinary levels and advanced levels, but eventually a national system called MATSEC (Matriculation Secondary Education Certificate) came into place in 1992 and replaced the English examinations. The MATSEC system includes ordinary levels and advanced levels and a new level in between the two termed "intermediate" levels. Nevertheless, a large number of resources, such as textbooks in schools are still British based. After two years at the sixth form, students sit for matriculation MATSEC examinations at intermediate and advanced levels.

Students can opt to go to a trade school after three years of secondary level education, but most continue with their studies towards the MATSEC. The MATSEC examinations enable successful students to move on to tertiary education, and particularly to university. There is one university in Malta, recognized by major foreign universities.

Research in the Field of Youth Studies

There is a considerable body of literature relating to the research on environmental knowledge and attitude. A lot of research has occurred on the primary and secondary school populations and also on the general population. However, much less emphasis has been placed on studies that concern post-compulsory education students in the range of 16-18 years old.

The majority of the studies that focus on post secondary education students in the year range of 16-18, used a quantitative technique to gather data (e.g., Barrett & Kuroda, 2002; Kaplowitz & Levine, 2005; Makki,

Abd-El-Khalick, & Boujaoude, 2003; Mogenson & Nielsen, 2001; Tuncer, Ertepinar, Tekkaya, & Sungur, 2005). Few studies utilized a qualitative technique to gather data (Sivek, 2002). The majority of studies reported a positive attitude towards the environment except a study by Gambro and Switzky (1996), and variety of levels of environmental knowledge. Other findings indicate poor knowledge of environmental issues, such as Kuhlemeier, Huub, and Nijs (1999) and Gambro and Switzky (1999). The majority of the studies did not actually investigate whether youth had taken any actions in relation to the environment.

Few environmental knowledge and attitudes studies have been carried out in dense island communities (Volk & Cheak, 2003; Hsu, 2004; Hsu & Roth, 1996). These studies mainly used quantitative techniques to gather data. Only the Volk and Cheak's (2003) study used a combination of qualitative and quantitative data gathering. The Hsu and Roth's (1996) study assessed the environmental knowledge and attitudes of a different age group from the present study but included a variety of statistical analyses that indicated the significance of certain results. Although the level of environmental knowledge was generally high, relatively negative environmental attitudes were exhibited when the respondents believed that personal sacrifice might be required.

Outline of the Methodology

The methodology for this study includes an analysis of the local social, cultural and environmental milieu in which environmental knowledge, attitudes and actions form. Data collection occurred through a class administered questionnaire survey.

The extended questionnaire was constructed following the examination of other instruments in the literature (e.g., Barrett & Kuroda, 2002; Eagles & Demare, 1999; Gambro & Switzky, 1996, 1999; Hodgkinson & Innes, 2001; Kuhlemeier et al., 1999; Makki et al., 2003; Mogenson & Nielsen, 2001; Fien, Yencken, & Sykes, 2000; Pawlowski, 1996) and examined four areas of environmental knowledge, (local issues, global issues, important environmental terms and information sources and their perceived reliability), awareness of local and global environmental problems, causes of environmental problems; possible solutions to environmental issues, thoughts and feelings about environmental issues and personal actions in relation to environmental issues. The quantitative data from the extended questionnaire included 135 variables per individual. The questionnaire also obtained information on socio-demographic characteristics of youth. The questionnaire was piloted with students in the same sample population to rectify the wording, the language and the meaning of questions and the ordering of question sequences by listening to the concerns of youth.

The sample consisted of 447 individuals which afforded a confidence level of 95% of the population of youth attending postsecondary institutions in Malta. Stratified sampling was used within the studied colleges and schools to ensure that youth studying languages, sciences, business and humanities were represented according to the actual percentages at the school level (see Table 1).

The relatively large sample size provided more accuracy for subclass estimators and differences between subclass estimators through finer divisions of the subclasses. Kalton argued that the choice of sample size often depends on an assessment of the costs of increasing the sample compared with the possible benefits of more detailed analyses (Kalton, 1983). The sample in this study has been biased as much as possible on detailed analyses and truthful representation without much consideration for the costs. This decision proved to be useful for the latter detailed analyses and generalizations of the results.

Table 1

Main Area of Study of Participants

	Frequency	Valid percent
Languages	182	40.9
Sciences	110	24.7
Business related	55	12.4
Humanities	98	22.0
Total	445	100.0
Unspecified	2	
Total	447	

Table 2

Most Common Words That Come to Mind When You Hear the World Environment

First word that comes to mind when you hear the word environment	Frequency	Rank
Nature	135	1
Pollution	121	2
Trees	39	3
Animals	37	4
Sea	21	5
Countryside	15	6
Plants	13	7
Earth	13	7
Buildings	13	7
The air	11	10
Ozone layer	11	10
Life/living things	11	10
Global warming	11	10
Air	9	14
Xummiemu	7	15
People	7	15
Greenery/green areas	7	15
Conservation	7	15
Streets/villages	5	19
Rubbish	5	19
Weather	3	21
Vegetation	3	21
Vandalism	3	21
Sustainable development	3	21
Soil	3	21
Society	3	21
Resources	3	21
Our surroundings	3	21
Mizbla (open dump)	3	21
Greenhouse effect	3	21
Forests	3	21
Diversity of life	3	21
Waste	2	33
Valleys	2	33
Sustainability	2	33
Sun	2	33

Results

The students' understanding of the word environment was comprehensive, but showed a definitive bias towards the biological and physical perspectives. The two main words associated with the word environment are "nature" and "pollution". The cultural and built environments were hardly mentioned. It seems that young people are aware of the physical and biological components, but do need a more holistic view of the environment that integrates the social component in order that people are a central component of this perspective (Posch, 1993) (see Table 2).

Students were very specific when it came to the local environment in the open-ended questions. In fact, the majority of students frequently mentioned that the environment in Malta was in a bad state.

> I think the environment in Malta is in a horrible state, solid waste littering the countryside, construction going on unrestricted and the Mediterranean sea being very polluted. Nahseb li l-Maltin ipoggu buthom u l-present qabel il-futur u l-ambjent u b'hekk mhumiex lesti jaghmlu sagrificcju ghal ambjent. (Maltese put their money in first place and are not ready to sacrifice anything for the environment) (2nd year, 17-year-old male, No. 226)

> It is in a critical state. But everyone has to make his effort to improve it. How many are really ready to do so? How many are ready to sacrifice their luxuries for the environment. (2nd year, 18-year-old male, No. 209)

Environmental Knowledge

The study revealed that the students' general environmental knowledge in the Maltese Islands had a mean score of 12.14 out of a maximum of 24. A difference was noted between the four main areas. Students were most knowledgeable about "global issues" with a mean score of 3.35 out of a maximum score of 6. It was followed closely by knowledge of important concepts with a mean score of 3.19, and further down by knowledge of local environmental issues with a mean score of 2.90. Students scored least in knowledge of local solutions with a mean of 2.69. The global environmental concept which was most correctly answered was the usefulness of the Ozone layer in absorbing harmful solar radiation (72.5% correct), followed by the Greenhouse effect (69.6% correct). The students were least familiar with renewable resources (26.0% correct). Notwithstanding the climatic advantages to use solar radiation, the Maltese are still totally dependent on fossil fuels for the production of electricity and the production of freshwater from seawater. Students' knowledge on local environmental issues was at a lower level than that of global environmental issues. The majority of the responses were below the level of 60%. The concept which was most correctly answered was fossil fuel combustion (61.1% correct), closely followed by local biodiversity (58.4% correct) and sewage management (57.0% correct). Tables 3, 4, 5 and 6 illustrate the results obtained in each section and for each individual question.

Table 3

Knowledge of Global Issues

Global environmental issue	Correct (%)
UV solar radiation and the ozone layer	72.5
Greenhouse effect	69.6
Renewable resources	26.0
CFC's and ozone depletion	54.6
Acid dain	49.4
Biodiversity depletion	63.1

Table 4

Knowledge of Local Issues

Local environmental issues	Correct (%)
Sewage management	57.0
Local biodiversity	58.4
Solid waste	40.3
Fossil fuels combustion	61.1
Quarrying	23.3
Local ecosystems	50.3

Table 5

Knowledge of Important Environmental Concepts

Important environmental concepts/terms	Correct (%)
Sustainable development	65.3
Carrying capacity	54.1
Agenda 21	22.8
Greenhouse effect	94.4
Root causes of environmental problems	23.0
Ecology	59.5

Table 6

Knowledge of Current Solutions to Environmental Issues

Current solutions to environmental issues	Correct (%)
Alternative energy	69.4
Catalytic converters	86.6
Biodiversity legislation	21.0
Scrubbers	15.4
Nature reserves	33.6
Biological pest control	43.0

Sources and Reliability of Environmental Information

Results showed that students received most information from school (65.3%), television (48.3%) and the Internet (43.8%). Conversely, students obtained the least amount of information from government agencies (10.1), radio (10.1%) and billboards (4.3%) (see Table 7). The sources of environmental information which were perceived by young people as being the most reliable included school (56.2%), books (47.4%) and the Internet (37.8%). On the other hand, radio (14.1%), billboards (13%) and friends (7.6%) were thought to provide the most unreliable environmental information (see Table 8).

Attitudes Towards the Environment

The overall attitude of students towards the environment appears to be strongly positive with thirteen out of a possible fifteen statements receiving at least 50% positive replies.

The statement that received the highest amount of positive replies (92.4%) was that “The Maltese public should be informed more on environmental issues through all types of media”. The ninety-two point two percent of the students were very much in favor of increased control of air pollution through the Maltese government. Other statements that scored highly on the attitude score include that, “The Maltese government should subsidize solar water heaters” (88.8%), “Maltese people must do their utmost to preserve the remaining

natural environments in Malta" (87.7%), "The Maltese government should invest in green alternatives for energy production" (87.0%) and "There should be harsher penalties for individuals that dump waste in the natural environment in Malta" (85.4%) (see Table 9).

Table 7

Sources of Environmental Information

	Rank	1st rated source for environmental information (%)	Mean	Sum
School	1	65.3	3.43	1,533
Television	2	48.3	3.19	1,425
Internet	3	43.8	3.03	1,354
Books	4	35.8	2.88	1,286
Family	5	33.1	2.44	1,090
Magazines	6	16.8	2.38	1,063
National campaigns	7	14.5	2.25	1,005
Friends	8	11.6	2.13	950
NGOs(non-governmental organizations)	9	11.9	2.09	934
Government agencies	10	10.1	2.03	907
Radio	11	10.1	2.02	901
Billboards	12	4.3	1.92	860

Table 8

Reliability of Environmental Information

	Rank	Rated 1st for reliable environmental information %	Mean	Sum
School	1	56.2	4.28	1,914
Books	2	47.4	4.05	1,812
Internet	3	37.8	3.87	1,730
Television	4	37.1	3.86	1,725
NGOs	5	33.9	3.62	1,620
National campaigns	6	30.4	3.60	1,610
Magazines	7	16.6	3.38	1,513
Family	8	17.2	3.24	1,448
Government agencies	9	14.1	3.24	1,447
Radio	10	14.1	3.21	1,433
Billboards	11	13	3.09	1,380
Friends	12	7.6	2.78	1,241

Actions Towards the Environment

Generally, students seemed to perform little positive actions towards the environment with 14 out of a possible 15 statements receiving less than 50% positive replies. The statement that received the highest amount of positive replies (52.7%) was "Taking a shower instead of a bath". It seems that students did try to reduce water consumption by having showers, but it appears that they do so not only for environmental reasons. In fact, only 37.2% of students made an effort to reduce water consumption for environmental reasons. Other reasons may include financial ones especially because of the relatively high price of water on the islands. Four actions were performed by less than 10% of the student population, including taking part in clean up campaigns (8%), becoming a member of an environmental group (6%), taking part in environmental NGO activities (4.6%) and

writing letters or attending a meeting with the aim of protecting the environment (3.9%). Table 10 illustrates the ranking of each statement in the action study.

Table 9

Attitudes Towards The Environment

	Rank	Percentage rating (%)	*N*
The Maltese public should be informed more on environmental issues through all types of media.	1	92.4	442
The Maltese government should increase control to reduce air pollution.	2	92.2	441
The Maltese government should subsidize solar water heaters.	3	88.8	442
Maltese people must do their utmost to preserve the remaining natural environments in Malta.	4	87.7	441
The Maltese government should invest in green alternatives for energy production.	5	87.0	440
There should be harsher penalties for individuals that dump waste in the natural environment in Malta.	6	85.4	442
All Maltese people should support the protection of an endangered species, even if they were never able to see one in the wild.	7	79.6	440
Maltese people should start building more energy efficient homes.	8	79.6	441
The Maltese people should decrease the use of the car.	9	76.1	442
Bird hunting and trapping should stop.	10	70.9	442
The Maltese people must prevent any type of organism from becoming extinct, even if it means sacrificing something for ourselves.	11	68.9	439
No new undeveloped land should be taken for development in Malta.	12	54.8	440
Using good quality water in Malta to flush toilets is a waste.	13	54.0	441
All Maltese people are responsible for ozone depletion.	14	48.7	442
Tourism is having a negative impact on the Maltese environment.	15	27.1	440

Table 10

Actions Towards the Environment: Ranking List

	Rank	Percentage rating (%)	*N*
Taking a shower instead of a bath	1	52.7	438
Walking for short distances instead of using transport	2	38.8	438
Making an effort to reduce water consumption for environmental reasons	3	37.2	436
Making an effort to reduce electricity consumption for environmental reasons	4	37	433
Informing yourself on the environment	5	33.8	438
Making use of composting bins	6	33.1	438
Choosing to recycle or re-use a product for environmental reasons	7	28.5	435
Separating waste	8	27.9	438
Choosing products that are environment-friendly	9	27.8	435
Planting a tree	10	13.3	437
Financially supporting the protection of an endangered species	11	11.5	436
Taking part in clean up campaigns	12	8	436
Becoming a member of an environmental group	13	6	433
Taking part in environmental NGO activities	14	4.6	436
Writing letters or attending a meeting with the aim of protecting the environment	15	3.9	436

Conclusions and Discussion

The findings from the research shed light on the effectiveness or the otherwise of current environmental

education providers. The importance of schooling as a provider of good and reliable environmental information has been highlighted in this study. Nevertheless, more consistency across schools is required and outdoor education needs to be higher on the agenda. Television has been afforded a high score for provision of information, but it has a lower rating with regards to reliability. Political interference seems to be the major obstacle. Vetting by an independent board would perhaps reduce this interference, but gaining trust in independent boards in the Maltese islands may mean employing non-Maltese residents.

It is clear that students are more knowledgeable about the global environment than about the local environment. This situation has possibly been brought about by a number of factors, but the main concern is the lack of textbooks on the Maltese environment. Rather than let authors try to make ends meet (Malta is a very limited market) and publish the books themselves (as the situation stands now), the government should actively commission authors to publish such books to fill in these lacunae.

The importance of factors (including media, family and friends, local context and knowledge) that influence attitudes has been highlighted in this study, as they are significantly related to pro-environmental behavior. NGOs, local policy makers and local educators have to take these findings very seriously when devising new environmental education programmes. It is to ensure that such programmes do not just lead to an accumulation of knowledge, but also to improved pro-environmental behavior. Researchers should start studying the effectiveness or otherwise of such programmes, so that maximum benefit is derived from the limited financial and human resources available.

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